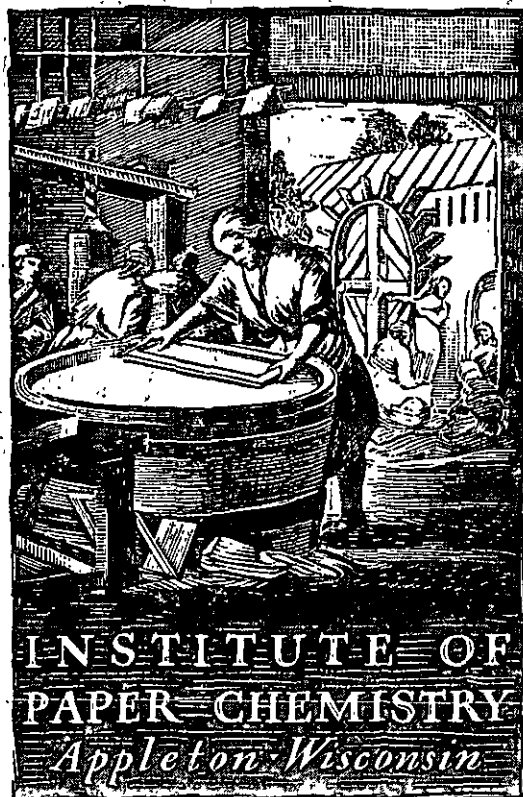


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CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

✓ Project 1108-17

Progress Report Three

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

January 1, 1956

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

The purpose of this study is to provide a continuous evaluation of the quality and runability of corrugating medium produced by members of the Fourdrinier Kraft Board Institute. The study, as it progresses, will accumulate a backlog of data and experience which will provide two important benefits. First, it will enable each participant to evaluate his position in relation to the rest of the industry. Second, it will provide information essential for the interpretation of any proposed specifications on corrugating medium (on either a company or industry basis).

The procedure for participating in this study involves the submission of two rolls of corrugating medium per week from each machine to The Institute of Paper Chemistry. These rolls are taken from regular production runs on different days. Each roll is 10 to 12 inches wide and contains approximately 2,500 lineal feet of medium (approximately 20 inches i. diameter). Each roll as it is received by the Institute is assigned a code letter and number. The rolls are numbered in the sequence in which they are received. Code letters are assigned on the basis of machines and a given machine is assigned a different code letter each month in order to mask the identity of the mills. For purposes of reference, a copy of the outline of the program together with the necessary instructions for sampling was appended to Progress Report One in this series.

During the month of December, seventy- three different sample lots of corrugating medium were submitted from the production of fourteen machines to The Institute of Paper Chemistry for evaluation. A tabulation of the samples classified according to machines may be seen in Table I.

TABLE I
DISTRIBUTION OF CORRUGATING MEDIUM SAMPLES

Machine Code	Number of Samples
A	1
B	2
C	5
D	9
E	8
F	7
G	7
H	8
I	7
J	4
K	0
L	8
M	6
N	1
Total	73

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush, H. and D. flat crush (single-faced board), and runability. Runability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 450 feet per minute. If unsatisfactory runability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runability was obtained (no ruptured flutes). As indicated above, flat crush was determined on the combined board, thereby providing data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

As requested by members of the F.K.B.I., the Concora medium test results are calculated on the basis of pounds of load per unit area rather than on the basis of the formula suggested by the Concora manufacturer and are now reported as Concora flat crush test results. In Progress Reports One and Two, the Concora medium test results were reported on the basis of the formula suggested by the Concora manufacturer. The current machine averages for the Concora medium test which were given in these two previous reports have also been recalculated on the basis of pounds of load per square inch of area of the formed specimen, i.e., load in pounds divided by the area of 1.67 sq. in. These recalculated results are given in the appendix of the present report, together with the various factors and indexes which were affected by the change.

The average test results obtained on the samples of corrugating medium submitted by each participant during December are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data among the various mills, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average is the average test result for all machines participating in the study during a given month. The cumulative F.K.I. average is based on the results for the previous months excluding the result for the current period. The F.K.I. index is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous periods; an index below 100% indicates that current quality is lower than the average result for the previous periods.

TABLE II
SUMMARY OF CURRENT MACHINE AVERAGES

Code	Basis Weight, lb.	Caliper, points	December, 1955	
			Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	26.2	12.2	34.1	34.1
B	26.0	10.5	29.8	29.4
C	26.3	9.9	32.2	32.3
D	27.0	10.4	32.9	34.2
E	26.6	10.5	33.3	33.6
F	25.5	11.1	28.7	30.1
G	29.2	10.9	28.4	31.7
H	26.2	10.8	34.1	34.1
I	29.0	10.8	30.3	30.3
J	23.8	9.8	33.7	35.6
K	No samples submitted			
L	26.9	10.3	31.4	31.7
M	26.9	10.3	33.0	32.9
N	27.4	10.9	21.8	22.4
Current F.K.I. Average	27.1	10.7	31.1	31.7
Cumulative F.K.I. Average	26.7	10.4	32.3	32.7
F.K.I. Index, %	101.4	102.4	96.3	97.0

Figure 1

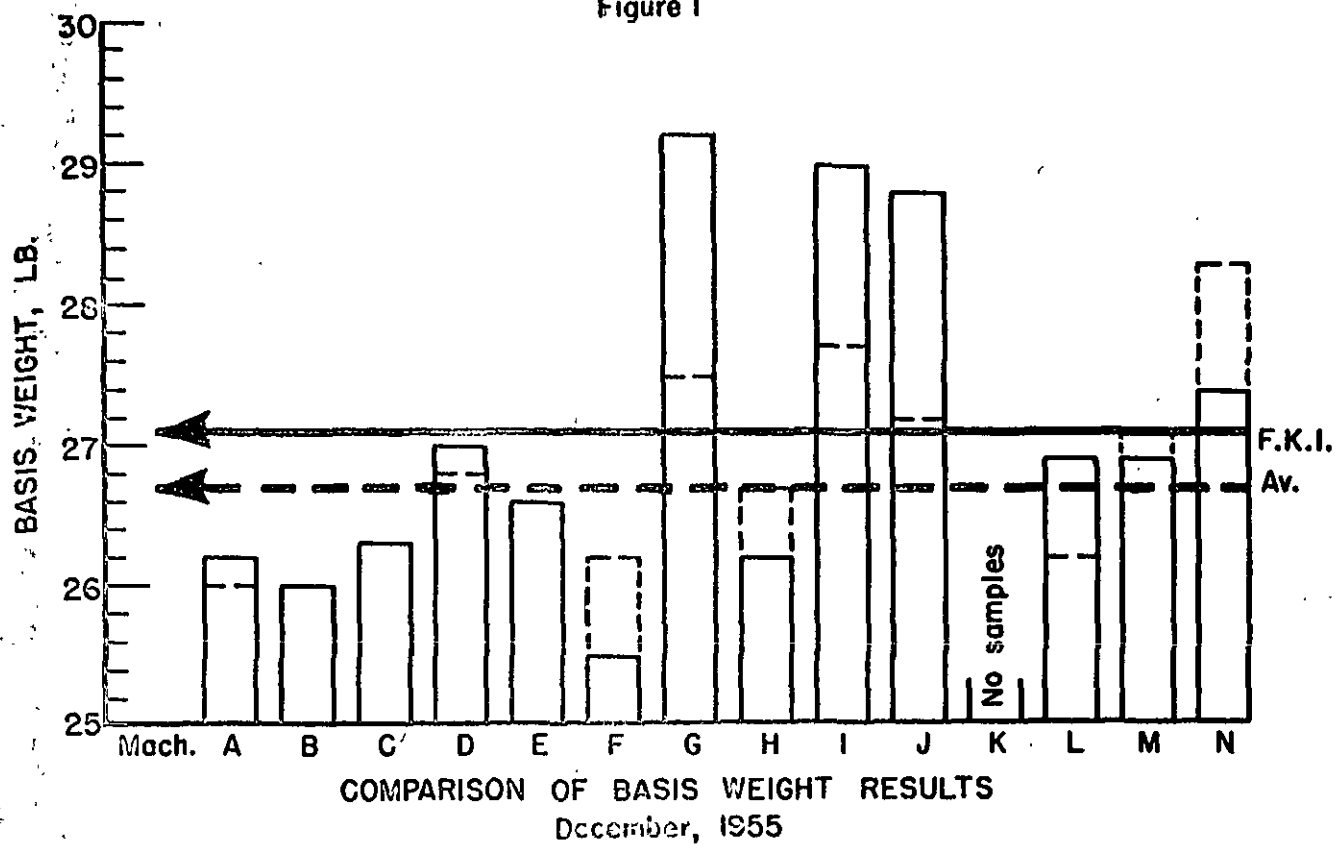


Figure 2

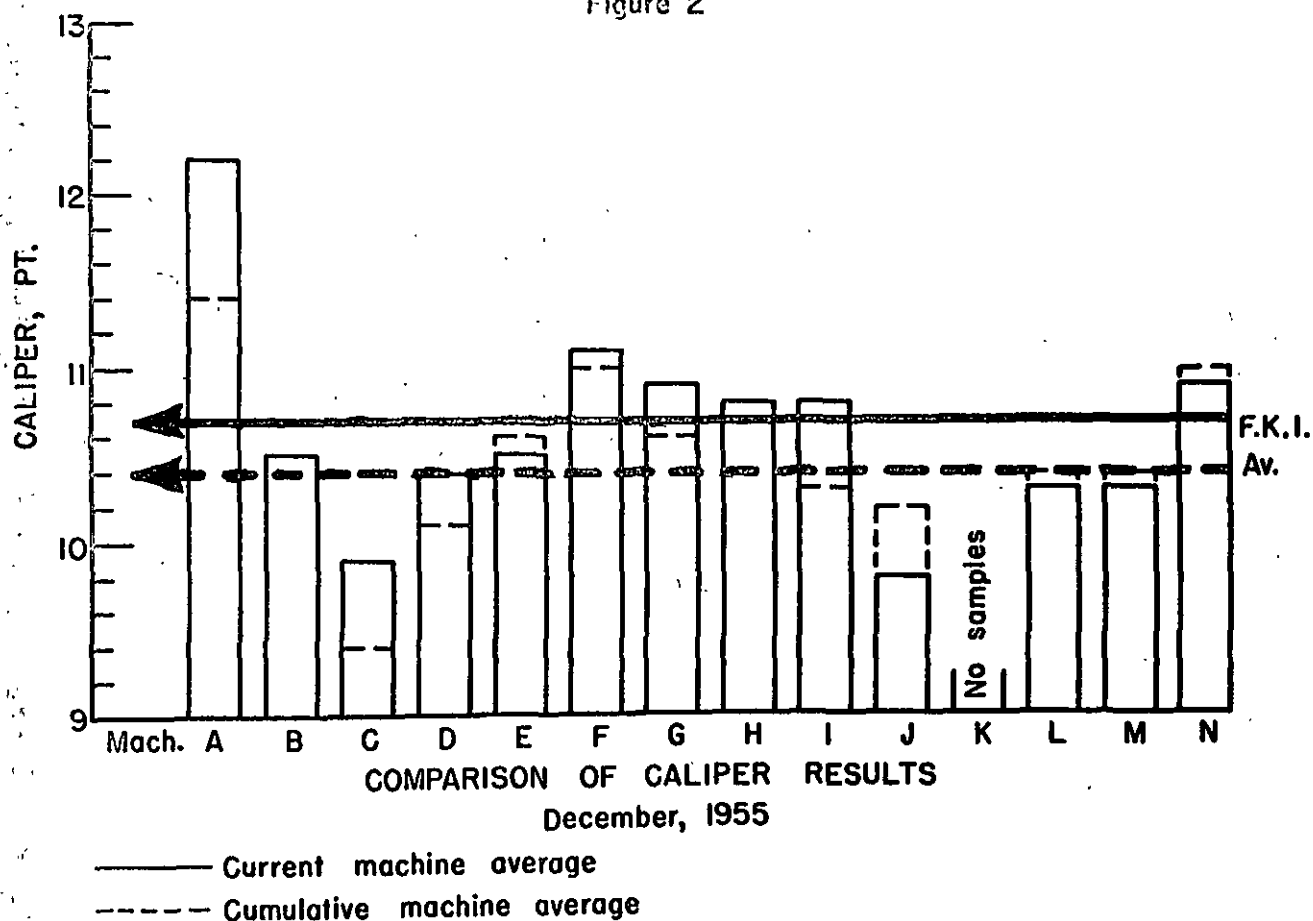


Figure 3

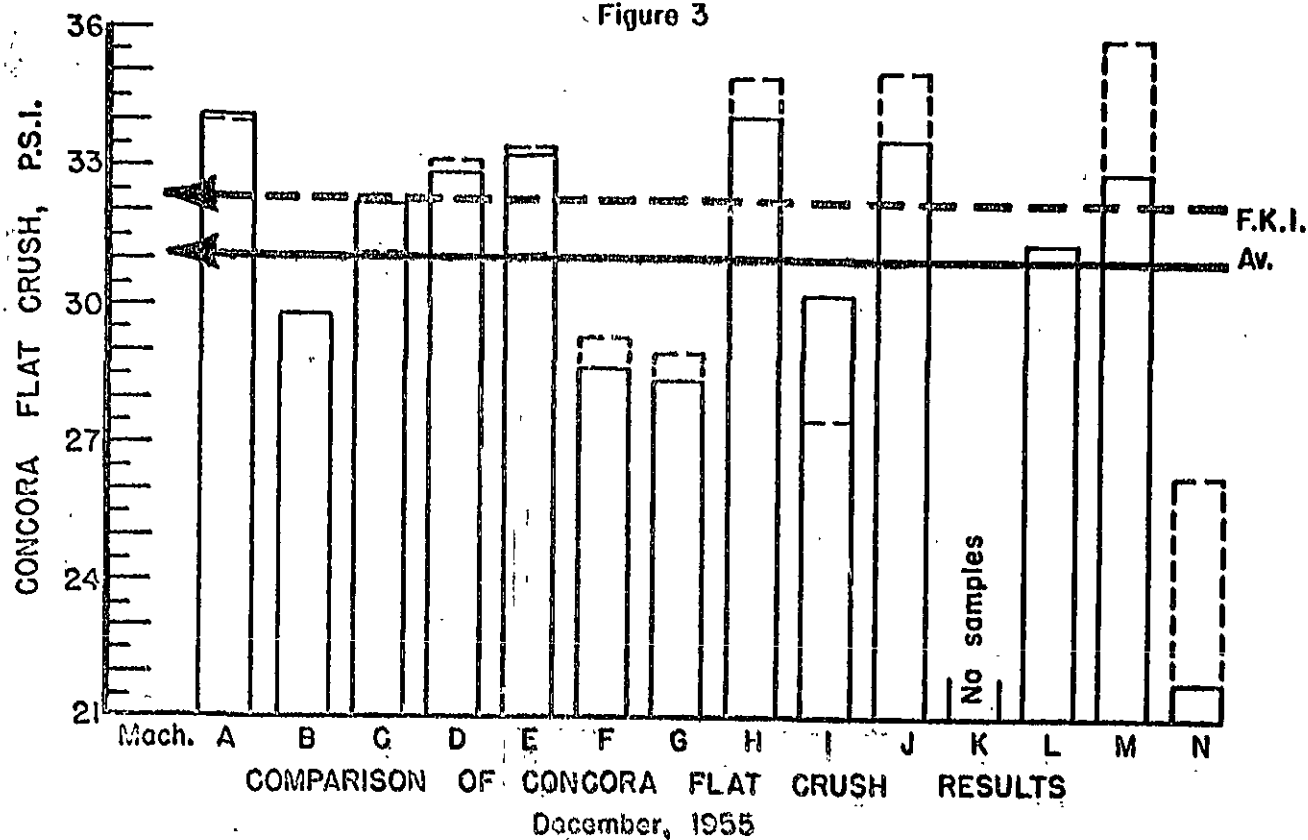
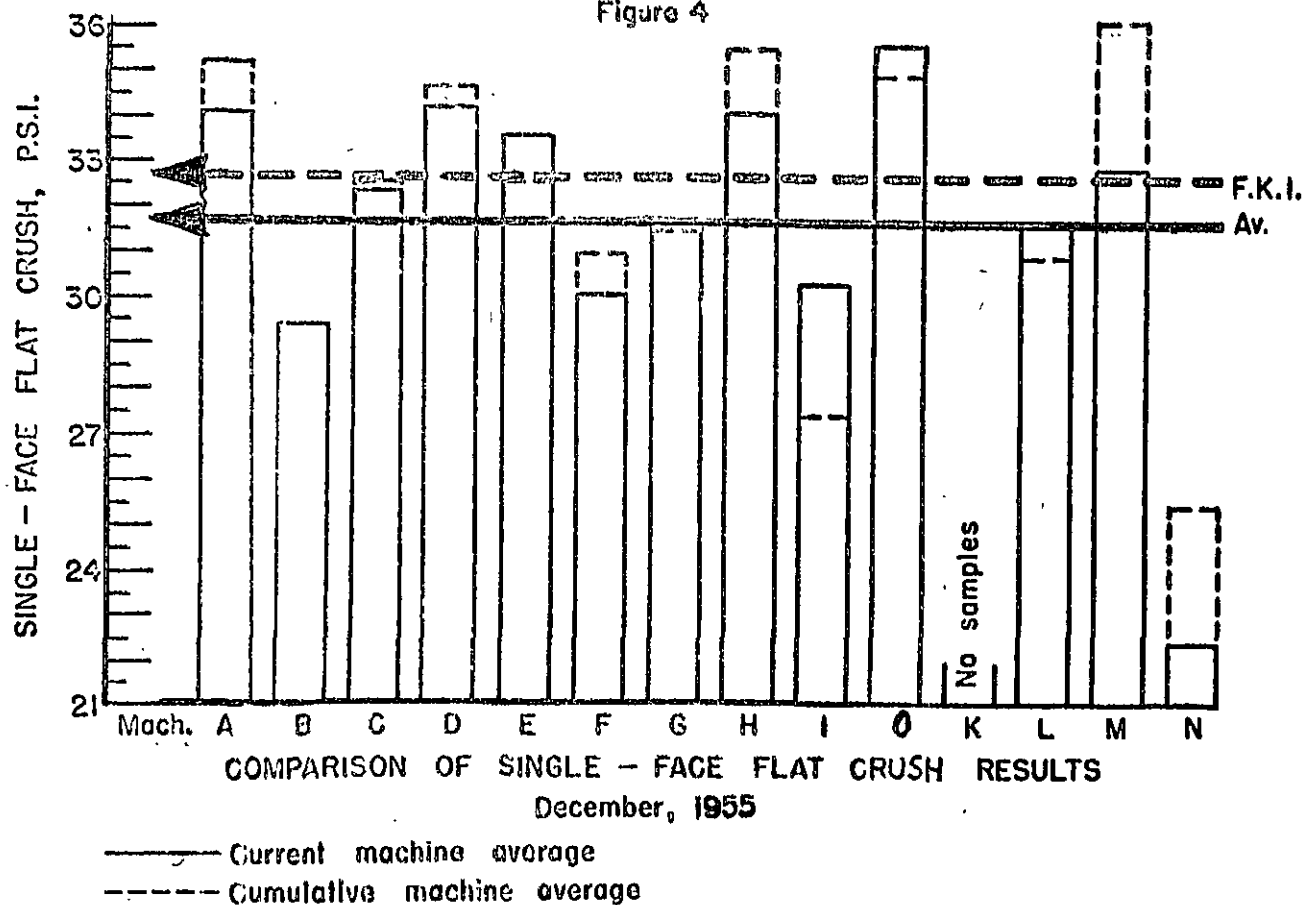


Figure 4



The test results obtained on the sample lots submitted from the production of each of the machines are shown in Tables III through XVI for A through N, respectively. The maximum, minimum, and average test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition, the over-all average result for all the sample lots submitted for each machine is shown for each test. The latter over-all averages are reported as "current machine averages." A cumulative machine average is also shown and is calculated by averaging the current machine average for the previous periods (excluding the current period).

Also shown for each machine in Tables III to XVI are the machine factor and machine index. These factors are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

In Table II the current machine averages for the month of December are summarized. It may be noted that basis weight varied from a low of 25.5 for Machine F to a high of 29.2 for Machine G. The average for the fourteen participating machines (current F.K.I. average) was 27.1 lb. per 1000 sq. ft., slightly higher than the cumulative F.K.I. average of 26.7 as indicated by the F.K.I. index of 101.4%. The results for all machines except F satisfy the requirements of Rule 41.

Caliper results varied from a low value of 9.8 for Machine J to a high value of 12.2 for Machine A. The current F.K.I. average for caliper was 10.7 points, slightly higher than the cumulative F.K.I. average of 10.4 points; the F.K.I. index was 102.4%. The caliper results for all mills meet the Rule 41 specification.

Flat crush based on the Concora test results ranged from a minimum of 21.8 p.s.i. for Machine N to a maximum of 34.1 p.s.i. for Machines A and H. The current F.K.I. average was 31.1 p.s.i., a little below the cumulative F.K.I. average of 32.3 as indicated by the F.K.I. index of 96.3%.

Machine J had the highest single-face flat crush value of 35.6 p.s.i. and machine N had the lowest value, 22.4 p.s.i. The current F.K.I. average for flat crush was 31.7 p.s.i. and the cumulative F.K.I. average was 32.7 giving an F.K.I. index of 97.0%.

TABLE III
SUMMARY OF TEST RESULTS FOR MACHINE A

		December, 1955									
Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability
					Max.	Min.	Max.	Min.	Max.	Min.	
A-1	11-18-55	12-8-55	1	26.2	12.4	11.8	12.2	35.6	30.5	34.1	34.1 Satisfactory at 450 f.p.m.
Current Machine Average				26.2	12.2		34.1		34.1		
Cumulative Machine Average				26.0	11.4		34.0		35.2		
Machine Factor, %				100.8	106.9		100.4		97.0		
Machine Index, %				98.2	117.0		105.6		104.3		

TABLE IV
SUMMARY OF TEST RESULTS FOR MACHINE B

		December, 1955									
Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability
					Max.	Min.	Max.	Min.	Max.	Min.	
B-1	12-7-55	12-13-55	1	26.0	11.1	10.1	10.5	30.8	29.3	30.2	29.7 Satisfactory at 450 f.p.m.
B-2	12-7-55	12-16-55	2	26.0	11.1	10.0	10.6	31.1	26.6	29.4	28.2 Satisfactory at 450 f.p.m.
Current Machine Average:				26.0	10.5		29.8		29.4		
Cumulative Machine Average:				--	--		--		--		
Machine Factor, %				--	--		--		--		
Machine Index, %				97.3	101.3		92.5		89.9		

SUMMARY OF TEST RESULTS FOR MACHINE C

December, 1955

TABLE V

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Av.	Max.	Min.	Av.		Max.	Min.	Av.
C-1	11-28-55	12-5-55	14	26.5	10.4	9.9	10.1	32.9	31.1	32.0	31.8	30.8	31.2	Satisfactory at 450 f.p.m.
C-2	11-29-55	12-6-55	15	27.3	10.0	9.8	9.9	34.7	29.3	32.0	33.0	29.8	31.5	Satisfactory at 450 f.p.m.
C-3	11-29-55	12-9-55	16	25.4	10.2	9.8	9.9	31.4	27.8	29.6	31.2	29.6	30.6	Satisfactory at 450 f.p.m.
C-4	12-5-55	12-13-55	17	25.5	9.8	9.2	9.3	33.8	30.8	32.6	34.2	32.0	33.4	Satisfactory at 450 f.p.m.
C-5	12-12-55	12-20-55	18	26.5	10.8	10.0	10.1	37.1	32.3	34.7	35.2	34.2	34.7	Satisfactory at 450 f.p.m.
Current Machine Average:				26.3			9.9		32.2				32.3	
Cumulative Machine Average:				26.3			9.4		31.2				32.6	
Machine Factor, %				100.0			105.4		103.1				99.0	
Machine Index, %				98.3			94.8		99.8				98.7	

TABLE VI
SUMMARY OF TEST RESULTS FOR MACHINE D
December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max. Min.	Concora Flat Crush, p.s.i. Av. Max. Min.	Single-Face Flat Crush, p.s.i. Max. Min. Av.	Runability
D-1	11-23-55	11-29-55	13	26.0	10.7 10.0	10.2 33.2 26.9 30.1	35.4 32.0 33.2	Satisfactory at 450 f.p.m.
D-2	11-25-55	12-2-55	14	26.8	10.9 10.1	10.6 32.6 30.5 31.6	35.2 31.4 33.4	Satisfactory at 450 f.p.m.
D-3	11-16-55	12-6-55	11	26.9	10.2 9.8	10.0 37.1 34.7 35.5	40.4 38.2 39.3	Satisfactory at 450 f.p.m.
D-4	11-29-55	12-6-55	15	26.5	10.2 9.8	10.0 36.2 31.7 34.6	37.6 35.2 36.8	Satisfactory at 450 f.p.m.
D-5	12-1-55	12-9-55	16	26.8	10.8 9.3	10.0 35.6 34.1 34.6	33.6 31.8 32.8	Satisfactory at 450 f.p.m.
D-6	12-6-55	12-13-55	17	27.0	11.5 10.8	11.0 34.4 31.7 32.6	31.6 30.0 30.6	Satisfactory at 450 f.p.m.
D-7	12-8-55	12-16-55	18	26.9	11.1 10.2	10.8 34.4 30.2 32.5	34.8 32.2 33.1	Satisfactory at 450 f.p.m.
D-8	12-13-55	12-20-55	19	26.6	11.5 10.5	10.9 33.8 29.9 32.3	36.6 34.0 35.2	Satisfactory at 450 f.p.m.
D-9	12-15-55	12-23-55	20	29.5	10.8 10.1	10.4 34.4 30.5 32.5	34.8 32.4 33.9	Satisfactory at 450 f.p.m.
Current Machine Average:				27.0		10.4 32.9	34.2	
Cumulative Machine Average:				26.8		10.1 33.2	34.7	
Machine Factor, %				100.8		103.1 99.1	98.7	
Machine Index, %				101.2		100.4 102.0	104.7	

TABLE VII
SUMMARY OF TEST RESULTS FOR MACHINE E

December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concore Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Max.	Min.	Max.	Min.				
E-1	11-22-55	11-28-55	15	26.3	11.1	10.8	10.9	35.0	29.6	32.3	35.0	31.6	33.8	Satisfactory at 450 f.p.m.
E-2	11-24-55	11-29-55	16	26.5	10.8	10.2	10.5	33.5	31.1	32.2	34.0	31.8	33.0	Satisfactory at 450 f.p.m.
E-3	11-29-55	12- 2-55	17	26.0	10.1	9.8	10.0	35.0	31.7	33.1	36.0	32.0	34.2	Satisfactory at 450 f.p.m.
E-4	12-1-55	12- 5-55	18	26.0	10.9	10.2	10.5	32.9	30.5	31.9	34.0	32.3	33.6	Satisfactory at 450 f.p.m.
E-5	12-6-55	12--9-55	19	27.0	11.1	10.3	10.7	38.0	35.0	36.4	34.6	31.6	33.6	Satisfactory at 450 f.p.m.
E-6	12- 8-55	12-13-55	20	23.4	10.9	10.0	10.4	42.8	32.6	37.3	38.0	34.8	36.6	Satisfactory at 450 f.p.m.
E-7	12-13-55	12-19-55	21	26.3	10.9	10.2	10.5	32.3	26.9	30.3	33.0	30.6	31.5	Satisfactory at 450 f.p.m.
E-8	12-15-55	12-20-55	22	26.5	10.9	10.2	10.7	34.4	32.3	33.1	33.6	31.4	32.9	Satisfactory at 450 f.p.m.
Current Machine Average:				26.6			10.5			33.3			33.6	
Cumulative Machine Average:				26.6			10.6			33.5			32.6	
Machine Factor, %				100.0			99.3			99.4			103.2	
Machine Index, %				99.7			101.2			103.1			102.8	

TABLE VIII
SUMMARY OF TEST RESULTS FOR MACHINE F

December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.				Single-Face Flat Crush, p.s.i.		Runability	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
F-1	11-22-55	11-29-55	30	26.3	11.4	10.5	11.0	31.4	24.3	27.7	32.0	29.8	31.1	Satisfactory at 450 f.p.m.
F-2	11-25-55	11-30-55	32	25.6	11.0	10.5	10.8	33.5	26.9	30.7	33.6	31.0	32.0	Satisfactory at 450 f.p.m.
F-3	11-29-55	12- 5-55	34	24.9	11.5	10.9	11.2	26.0	24.3	25.4	30.6	28.0	28.8	Satisfactory at 450 f.p.m.
F-4	12-2-55	12- 6-55	36	25.5	12.0	11.1	11.6	30.8	24.3	28.4	30.8	27.0	28.8	Satisfactory at 450 f.p.m.
F-5	12- 6-55	12-13-55	38	25.2	11.1	10.5	10.8	33.5	28.4	30.7	31.8	29.4	30.4	Satisfactory at 450 f.p.m.
F-6	12- 9-55	12-19-55	40	24.6	11.5	10.9	11.2	25.7	22.8	24.6	27.4	25.0	26.3	Satisfactory at 450 f.p.m.
F-7	12-13-55	12-19-55	42	26.3	11.5	10.8	11.0	35.3	31.7	33.6	36.2	30.6	33.2	Satisfactory at 450 f.p.m.
Current Machine Average:				25.5	11.1					28.7			30.1	
Cumulative Machine Average:				26.2	11.0					29.3			31.0	
Machine Factor, %				97.1	100.6					98.1			96.9	
Machine Index, %				95.4	106.5					89.1			91.9	

TABLE IX
SUMMARY OF TEST RESULTS FOR MACHINE G

December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Max.	Min.	Max.	Min.				
G-1	11-25-55	11-29-55	--	30.1	11.2	10.8	11.0	31.4	28.1	29.2	34.4	31.0	32.8	Satisfactory at 450 f.p.m.
G-2	11-29-55	12- 5-55	--	29.3	11.8	11.1	11.3	27.8	26.0	27.1	31.2	29.6	30.2	Satisfactory at 450 f.p.m.
G-3	12- 1-55	12- 9-55	1	28.8	11.5	10.5	10.8	32.6	26.3	28.9	32.6	31.0	31.7	Satisfactory at 450 f.p.m.
G-4	12- 6-55	12-12-55	1	29.8	11.9	11.0	11.5	28.7	26.6	27.8	31.0	29.6	30.4	Satisfactory at 450 f.p.m.
G-5	12- 8-55	12-13-55	1	28.2	10.3	9.8	10.2	32.6	29.3	31.0	34.8	33.4	34.4	Satisfactory at 450 f.p.m.
G-6	12-15-55	12-20-55	2	29.9	11.1	10.5	10.9	29.9	26.6	27.8	32.2	30.2	31.0	Satisfactory at 450 f.p.m.
G-7	12-13-55	12-20-55	1	28.2	10.8	10.0	10.3	29.6	24.6	27.2	32.8	30.8	31.6	Satisfactory at 450 f.p.m.
Current Machine Average:				29.2	10.9				28.4				31.7	
Cumulative Machine Average:				27.5	10.6				29.0				31.5	
Machine Factor, %				106.1	102.5				98.1				100.7	
Machine Index, %				109.2	104.4				88.1				96.9	

TABLE X
SUMMARY OF TEST RESULTS FOR MACHINE H
December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Durability			
					Max.	Min.	Max.	Min.	Max.	Min.				
H-1	11-22-55	11-29-55	29	26.6	10.9	10.0	10.4	33.8	30.8	31.9	33.6	32.0	32.9	Satisfactory at 450 f.p.m.
H-2	11-25-55	11-30-55	31	26.6	11.5	10.8	11.1	33.8	29.0	32.2	32.8	30.3	31.6	Satisfactory at 450 f.p.m.
H-3	11-29-55	12--5-55	33	25.7	11.0	10.5	10.8	35.0	29.9	32.8	34.8	29.6	32.8	Satisfactory at 450 f.p.m.
H-4	12-2-55	12- 5-55	35	26.8	11.5	11.0	11.1	39.2	35.3	36.5	34.4	32.4	33.6	Satisfactory at 450 f.p.m.
H-5	12- 6-55	12-13-55	37	25.7	11.1	10.1	10.6	35.3	31.7	33.5	34.0	31.4	33.0	Satisfactory at 450 f.p.m.
H-6	12- 9-55	12-19-55	39	25.4	11.0	10.4	10.9	40.4	33.8	36.6	35.8	32.0	34.0	Satisfactory at 450 f.p.m.
H-7	12-13-55	12-19-55	41	26.2	11.1	10.0	10.8	36.5	30.5	34.6	39.6	35.4	37.2	Satisfactory at 450 f.p.m.
H-8	12-16-55	12-22-55	43	26.3	11.2	10.5	11.0	35.9	33.2	35.0	40.4	35.2	37.4	Satisfactory at 450 f.p.m.
Current Machine Average:				26.2	10.8		34.1		34.1		34.1		34.1	
Cumulative Machine Average:				26.7	10.8		34.9		35.5		35.5		35.5	
Machine Factor, %:				95.1	100.0		97.8		96.0		96.0		96.0	
Machine Index, %				93.0	104.1		105.8		104.1		104.1		104.1	

TABLE XI
SUMMARY OF TEST RESULTS FOR MILL I
December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Max.	Min.	Max.	Min.				
I-1	11-22-55	11-29-55	7	28.5	11.1	10.5	10.9	29.6	25.4	27.1	27.8	27.0	27.3	Satisfactory at 450 f.p.m.
I-2	11-29-55	12--6-55	9	29.8	11.0	10.5	10.8	35.6	32.3	33.6	37.0	30.2	34.2	Satisfactory at 450 f.p.m.
I-3	11-30-55	12--6-55	10	29.0	11.0	10.5	10.8	37.7	34.7	35.7	37.0	32.4	34.4	Satisfactory at 450 f.p.m.
I-4	12- 5-55	12-12-55	11	30.4	11.2	10.9	11.0	33.5	31.4	32.5	31.8	28.8	30.6	Satisfactory at 450 f.p.m.
I-5	12- 6-55	12-12-55	12	29.2	11.1	10.5	10.9	31.7	27.2	30.0	28.6	27.0	27.9	Satisfactory at 450 f.p.m.
I-6	12-14-55	12-22-55	13	28.4	11.0	10.1	10.7	29.3	26.6	26.7	33.6	30.4	31.8	Satisfactory at 450 f.p.m.
I-7	12-15-55	12-22-55	14	27.8	10.9	10.3	10.6	27.5	24.0	26.3	27.6	24.8	26.2	Satisfactory at 450 f.p.m.
Current Machine Average:				29.0	10.8		30.3		30.3		30.3			
Cumulative Machine Average:				27.7	10.3		27.6		27.6		27.4			
Machine Factor, %:				104.6	105.4		109.7		109.7		110.5			
Machine Index, %:				108.7	104.1		93.9		93.9		92.7			

TABLE XII
SUMMARY OF TEST RESULTS FOR MACHINE J

December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Av.	Max.	Min.	Av.		Max.	Min.	Av.
J-1	12-2-55	12-9-55	80	28.8	10.2	9.6	9.8	37.1	34.1	35.2	37.2	34.0	35.3	Satisfactory at 450 f.p.m.
J-2	12-2-55	12-9-55	85	29.7	10.3	9.2	9.7	36.5	32.3	34.7	38.0	35.0	35.9	Satisfactory at 450 f.p.m.
J-3	--	12-16-55	5	28.2	10.2	9.2	9.8	34.4	32.9	33.7	37.0	34.0	35.2	Satisfactory at 450 f.p.m.
J-4	--	12-16-55	6	28.7	10.2	9.9	10.0	34.1	29.0	31.5	37.8	34.0	36.0	Satisfactory at 450 f.p.m.
Current Machine Average:				28.8			9.8		33.7				35.6	
Cumulative Machine Average:				27.2			10.2		35.1				34.9	
Machine Factor, %:				106.1			96.7		96.0				101.9	
Machine Index, %:				108.0			94.6		104.6				108.8	

TABLE XIII
SUMMARY OF TEST RESULTS FOR MACHINE K

No samples submitted.

TABLE XIV
SUMMARY OF TEST RESULTS FOR MACHINE L

December, 1955

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Av.	Max.	Min.	Av.		Max.	Min.	Av.
L-1	11-22-55	11-28-55	15	26.3	10.5	10.0	10.3	31.7	27.5	29.8	32.8	30.0	31.6	Satisfactory at 450 f.p.m.
L-2	11-24-55	11-29-55	16	27.0	10.8	10.0	10.3	31.1	28.7	29.8	33.4	30.8	32.0	Satisfactory at 450 f.p.m.
L-3	11-29-55	12-2-55	17	26.2	10.2	10.0	10.1	34.4	31.7	32.6	32.8	30.0	31.4	Satisfactory at 450 f.p.m.
L-4	12-1-55	12-5-55	18	26.3	10.9	10.4	10.7	33.2	29.3	30.7	31.2	29.8	30.5	Satisfactory at 450 f.p.m.
L-5	12-6-55	12-9-55	19	26.6	10.8	10.2	10.5	38.0	33.2	35.5	33.4	31.2	32.4	Satisfactory at 450 f.p.m.
L-6	12-8-55	12-13-55	20	30.6	10.8	10.0	10.2	30.2	27.2	29.1	33.4	30.4	31.6	Satisfactory at 450 f.p.m.
L-7	12-13-55	12-19-55	21	26.2	10.8	10.0	10.3	35.9	32.3	34.0	32.8	31.4	32.2	Satisfactory at 450 f.p.m.
L-8	12-15-55	12-20-55	22	25.7	10.9	10.0	10.2	30.2	29.3	29.5	34.2	31.4	32.2	Satisfactory at 450 f.p.m.
Current Machine Average:				26.9	10.3		31.4				31.7			
Cumulative Machine Average:				26.2	10.4		31.4				30.9			
Machine Factor, %:				102.5	98.9		100.0				102.8			
Machine Index, %:				100.7	99.2		97.3				97.0			

TABLE XV
SUMMARY OF TEST RESULTS FOR MACHINE M

December, 1955														
Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability			
					Max.	Min.	Av.	Max.	Min.	Av.		Max.	Min.	Av.
M-1	11-22-55	11-29-55	3	27.1	10.4	9.5	9.9	29.3	25.1	26.9	31.2	30.0	30.7	Satisfactory at 450 f.p.m.
M-2	11-29-55	12-6-55	4	27.6	11.2	11.0	11.1	39.5	34.4	36.6	37.0	32.2	34.6	Satisfactory at 450 f.p.m.
M-3	12-2-55	12-9-55	5	27.1	11.2	9.7	10.2	35.9	27.2	32.8	32.6	31.0	32.1	Satisfactory at 450 f.p.m.
M-4	12-5-55	12-12-55	6	26.6	10.5	9.9	10.1	38.0	33.2	35.2	34.2	32.6	33.4	Satisfactory at 450 f.p.m.
M-5	12-9-55	12-19-55	7	27.1	10.9	10.0	10.2	35.3	32.3	34.0	36.2	34.0	35.0	Satisfactory at 450 f.p.m.
M-6	12-13-55	12-22-55	8	25.8	10.9	10.0	10.3	34.7	30.8	32.6	33.8	30.0	31.6	Satisfactory at 450 f.p.m.
Current Machine Average:				26.9			10.3			33.0			32.9	
Cumulative Machine Average:				27.1			10.4			35.9			36.2	
Machine Factor, %:				99.1			98.8			92.0			90.8	
Machine Index, %:				100.6			99.1			102.4			100.6	

TABLE XVI
SUMMARY OF TEST RESULTS FOR MACHINE N

	December, 1955												Satisfactory at 450 f.p.m.
	N-1	11-22-55	11-29-55	8	27.4	11.1	10.8	10.9	24.0	20.4	21.8	24.2	
Current Machine Average:													
Cumulative Machine Average:													
Machine Factor, %:													
Machine Index, %													

APPENDIX

CONCORA FLAT CRUSH TEST RESULTS* FOR OCTOBER AND NOVEMBER, 1955

October, 1955		November, 1955			
Concora Flat Crush, p.s.i.		Concora Flat Crush, p.s.i.			
Mill	Current Machine Average	Current Machine Average	Cumulative Machine Average	Machine Factor, %	Machine Index, %
A	34.4	27.6	--	--	88.1
B	38.5	32.5	34.4	94.6	103.9
C	28.4	26.3	--	--	84.1
D	32.9	29.0	--	--	92.5
E	31.4	29.5	--	--	94.0
F	31.8	31.8	38.5	82.4	101.4
G	34.7	34.0	--	--	103.3
H		31.0	31.8	97.4	93.9
I		33.6	32.9	102.0	107.1
J		35.9	--	--	114.6
K		30.2	28.4	106.5	96.4
L		31.0	31.4	93.7	99.1
M		35.0	34.7	100.9	111.8
Current F.K.I. Av.	33.2				
Cumulative F.K.I. Av.	--				
F.K.I. Index, %	--				
Current F.K.I. Average		31.3			
Cumulative F.K.I. Average		33.2			
F.K.I. Index, %		94.5			

* Load in pounds divided by area of fluted specimen, 1.67 sq. in.